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REFER	ENCE DESIGNA	ATION	U.S. PA	TENT DOCUMENTS		chter 20	500				
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1977	05/23/00	6,067,290	Paulraj		370	329	07/30/99				
	05/16/00	6,064,694	Clark e	t al.	375	224	09/30/97				
	05/16/00	6,064,692	Chow		375	219	06/20/97				
	04/18/00	6,052,594	Chuang	g et al.	455	450	04/30/97				
	03/21/00	6,041,237	Farsakh	1	455	4 50	04/02/98				
	12/21/99	6,005,876	Cimini,	Jr. et al.	370	525	09/24/96				
	10/26/99	5,973,642	Li et al.		342	378	04/01/98				
34	09/21/99	5,956,642	Larssor	et al.	455	449	11/25/96				
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	FOREIGN PATENT DOCUMENTS No. Document No. Date Country Name Class Sub- Trans-										
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18. 7				Bandwidth-Efficient High-Speed ations Magazine, July 2000, pp		a Servic	e for				
				s For Mobile Communication Sys		s And C	hallenoes				
'/				Ingineering Journal, April 1999	-	21114	inition geo,				
				city Using a Smart Antenna Base		IEEE, p	p. 868-872.				
(.	FARSAK	H, CHRISTO	F and NO	SSEK, JOSEF A., On the Mobile	Radio Capac	ity Incre	ase Through				
		o date (after 1									
				mance in Cellular Environments							
/		•	EE Transa	actions on Vehicular Technolog	gy, Novemb	er 1996,	pp.657-665				
	Vol. 45, N		III SANI	-QI, Throughput Multiplication	of Wireless L	inc for A	Aultimadia				
				1994 IEEE, pp. 1326-1332.	oj vilicios Li	பம் 101 18	initiiitulu				
				I, R. TED, JR., High Throughput	Slotted ALO	HA Pac	ket Radio				
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	FOREIGN PATENT DOCUMENTS												
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11.2	В	GB	2 209 858	Α	Motorola Limited	08-06-1997							
01-7	С	WO	98/30047	A1	Array-Comm, Inc.	07-09-1998							
デル	D	WO	98/16077	A2	Teratech Corporation	04-16-1998							
からえ	E	EP	0 926 912	A2	CSELT Centro Studi e Lab.	06-30-1999							
いかった	F	DE	198 00 953	C1	Siemens AG	07-29-1999							
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¹Unique citation designation number. ²See attached Kinds of U.S. Patent Documents. ³Enter Office that issued the document, by the two-letter code (WIPO Standard S.3). ⁴For Japanese patent documents, the indication of the year of reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.

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1.7.	G	Sensitive Channel Al	llocation", Wire	SDMA Mobile Radio Capacity eless Personal Communication ber 1999, pages 63-76, XP00	ns, Kluwer Academic			
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		Number Code ²	Kind (If known)			MM-	-DD-YYYY	Passages or Relevant Figures Appear	
1/2	Н	6,377,632	B1	Pai	ulraj et al.	04/	23/2002)	

Initial* No.1		0.0		of Cited Document	Cited Document	Where Relevant
	110.	Number Code ²	Kind (If known)	or ortoo posumoria	MM-DD-YYYY	Passages or Relevant Figures Appear
1-6	Н	6,377,632	B1	Paulraj et al.	04/23/2002	
T	I	6,131,016		Greenstein et al.	10/10/2000	
	J	6,026,123		Williams	02/15/2000	/
	K	5,914,933		Cimini et al.	06/22/1999	
)	L	5,726,978		Frodigh et al.	03/10/1998	
	M	5,708,973		Ritter	01/13/1998	
	N	5,555,268		Fattouche et al.	09/10/1996	
	0	5,504,775		Chouly et al.	04/02/1996	· ·
152	P	5,479,447		Chow et al.	12/26/1995	/
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ND	Q	EP	0 869 647	A2	Lucent Technologies Inc.	10/07/1998		
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7.2	R	IEEE Jo	ONG, C.Y., et al., <i>Multiuser OFDM With Adaptive Subcarrier, Bit, and Power Allocation</i> , EE Journal on Selected Areas in Communications, October 1999, IEEE Inc., New York, SA, Vol. 17, Nr. 10, pages 1747-1758, XP000854075, ISSN: 0733-8716 Sections I and II							
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17.2	S	6,144,696	Α		vely et al.		07/2000				
18-7	T	6,131,016	Α		nstein et al.		10/2000				
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11.7	٧	FR	2 777 407	A1	Wavecom SA	10/15/1999	, iguiourippou.	
11.7	W	EP	0 929 202	A1	Lucent Technologies, Inc.	07/14/1999		
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Assistant Commissioner for Patents, Washington, DC 20231.

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44	Y	Transmission Techniqu	ue", Wireles	Modulation and Multiple Acces s Personal Communications, K ear 2000, pages 5-13 XP0008	luwer Academic	
	Z	OFDM" 11 th IEEE Inter Communications, vol. 2 Piscataway, NJ, USA,	national Syr 2, 18-21 Ser ISBN: 0-780		nd Mobile Radio 40, XP002213669,	
	AA	KAPOOR, S. et al.: "Adaptive Interference Suppression in Multiuser Wireless OFDM Systems Using Antenna Arrays" IEEE Transactions on Signal Processing, vol. 47, no. 12, December 1999, pages 3381-3391, XP000935422, IEEE, New York, USA, ISSN: 1053-587X.				
	BB	YE LI, et al.: "Clustered OFDM with channel estimation for high rate wireless data", Mobile Multimedia Communications, 1999. (MOMUC '99). 1999 IEEE International Workshop on San Diego, CA, USA, IEEE, US, 15 November 1999, pages 43-50, XP010370695, ISBN: 0-7803-5904-6.				
	CC	NOGUEROLES, R. et al.: "Improved Performance of a Random OFDMA Mobile Communication System" Vehicular Technology Conference, 1998. VTC 98. 48 th IEEE Ottawa, Ontario, Canada, 18-21 May 1998, (1998-05-18), pages 2502-2506, XP010288120, ISBN: 0-7803-4320-4.				
X.Z	DD	KINUGAWA, Y. et al.: "Frequency and Time Division Multiple Access with Demand-Assignment Using Multicarrier Modulation for Indoor Wireless Communications Systems", IEICE Transactions on Communications, Institute of Electronics Information and Comm. Eng. Tokyo, Japan, vol. E77-B, NR. 3, March 1994, pages 396-402, XP000451014, ISSN: 0916-8516.				
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	Numbe	r-Kind Code ² (If known)			RFC FIVE
かえ	US-	5,734,967	3/31/1998	Kotzin et al.	
1	US-	5,886,988	3/23/1999	Yun et al.	JAN 2 9 2004
	US-	5,887,245	3/23/1999	Lindroth et al.	0711 2 3 2004
	US-	5,933,421	8/3/1999	Alamouti, et al.	echnology Center 2
	US-	6,061,568	5/9/2000	Dent	dominology, center 5
	US-	6,108,374	8/22/2000	Balachandran et al.	
	US-	6,226,320 B1	5/1/2001	Hakkinen et al.	
	US-	6,366,195 B1	4/2/2002	Harel et al.	/
	US-	6,477,158 B2	11/5/2002	Take	
	US-	2003/0067890 A1	4/10/2003	Goel et al.	
<i>ι</i> /\· 7.	US-	2003/0169824 A1	9/11/2003	Chayat	7
	US-				

FOREIGN PATENT DOCUMENTS								
Examiner Initials*	Cite No. ¹	Foreign Patent Document Country Code ³ Number ⁴ Kind Code ⁵ (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ₆		
19. 3.		JP 06029922	2/4/1994	Mitsuru et al.				

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